Before the
FEDERAL COMMUNICATIONS COMMISSION   AUG ~ 9 1996
Washington, DC 20554

In the Matter of   )
)   CC Docket No. 96-45
Federal-State Joint Board on   )
Universal Service   )

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COMMENTS ON COST PROXY MODELS

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August 9, 1996

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COMMENTS ON COST PROXY MODELS

I.   INTRODUCTION AND SUMMARY

U S WEST, Inc. ("U S WEST") is pleased to comment in response to the

Federal Communications Commission's (or "Commission") Public Notice[1] regarding

proxy cost models. U S WEST has been a leader in the development of proxy cost

models for the analysis and targeting of explicit support to areas where the cost of

providing basic telephone service is high.

In 1994, in response to the Commission's Notice of Inquiry,[2] U S WEST filed

its first proxy cost model which utilized two factors, distance from the central office

and density of customers, to identify areas which were high cost to serve.[3] While

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[1] Public Notice, Common Carrier Bureau Seeks Further Comments On Cost Models In Universal Service Notice Of Proposed Rulemaking, CC Docket No. 96-45, DA 96-1094, rel. July 10, 1996 ("Public Notice").

[2] In the Matter of Amendment of Part 36 of The Commission's Rules And Establishment of a Joint Board, Notice of Inquiry, 9 FCC Rcd. 7404 (1994) ("Notice of Inquiry").

[3] Comments of U S WEST, CC Docket No. 80-286, filed Oct. 28, 1994.

crude, this proxy cost model demonstrated the potential for the use of proxy cost

models to target high-cost support to small geographical areas.

In 1995, in response to the <u>Notice of Proposed Rulemaking</u>,[4] U S WEST, MCI

Telecommunications Corporation ("MCI"), The NYNEX Telephone Companies

("NYNEX") and Sprint Corporation ("Sprint") (collectively "Joint Sponsors"),

introduced the Benchmark Cost Model ("BCM").[5] The BCM uses a dynamic design

algorithm to engineer a telecommunications network utilizing central office

topology and state-of-the-art technology. In addition to recognizing the distance

customers are from the central office and subscriber density, the BCM also takes

into consideration soil and other factors which would impact the cost of placing the

plant. It tapers the outside plant in a manner which takes into consideration the

economies of scale in feeder and distribution cable. Although the BCM contained

many simplifying assumptions, some of which caused material misstatement of the

results, it provided the framework for an improved method for identifying the

relative costs of serving different geographical areas for the analysis and targeting

of high-cost support.[6]

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[4] <u>In the Matter of Amendment of Part 36 of The Commission's Rules And Establishment of a Joint Board</u>, <u>Notice of Proposed Rulemaking and Notice of Inquiry</u>, 10 FCC Rcd. 12309 (1995) ("<u>NPRM</u>"); <u>Order</u>, 10 FCC Rcd. 10961 (1995).

[5] <u>See</u> Letter to William F. Caton, Federal Communications Commission, from the Joint Sponsors, dated Sep. 12, 1995 ("Sep. 12 Letter").

[6] As stated in the Executive Summary of the Sep. 12 Letter: "The purpose of this study is to identify those CBGs [Census Block Groups] in which the cost of providing basic telephone service is so high that some form of explicit high-cost support may be necessary." "[T]he BCM provides a benchmark measurement of the relative costs of serving customers residing in given areas, i.e., the CBGs."

On July 3, 1996, U S WEST and Sprint filed the Benchmark Cost Model 2 ("BCM2").[7] BCM2 reflected input received from four formal workshops sponsored to acquaint the public with the BCM,[8] from the comment and replies in CC Docket Nos. 80-286 and 96-45, and from direct input from the Joint Board staff and key public policy and industry leaders. We also developed BCM2 to address the misuse by certain parties (including BCM Joint Sponsor MCI) of the BCM results as a proxy for the actual cost of serving all geographical areas, both rural and urban. Because the BCM was developed initially to target high-cost support, it did not include all necessary urban cost structures because it was assumed that no high-cost support would be provided in urban areas. Since we were attempting to identify the relative cost of serving high-cost areas, certain network elements which would be the same regardless of location (such as pedestal, drop and network interface device) were not included in the cost. Following is a brief summary of the major enhancements included in the BCM2.

- The BCM assumption of uniform distribution of subscribers throughout the CBG has been replaced in sparsely populated areas by a method which looks only at populated areas.

- All cost elements necessary for the provision of basic telephone service are now included.

- Urban cost elements (e.g., conduit, street cutting, boring, etc.) are now accurately reflected. The simplified distribution plant assumptions in

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[7] See Letter to William F. Caton, Federal Communications Commission, from Jay C. Keithley, Sprint, and Glenn Brown, U S WEST, re: CC Docket No. 96-45, dated July 3, 1996 ("July 3 Letter").

[8] These four workshops were conducted in Washington, DC, Denver, CO, Portsmouth, NH, and New Orleans, LA.

BCM have been replaced with a more robust distribution plant algorithm in BCM2 which assures that distribution plant is extended to every lot line in the CBG.

- Expenses are now computed more accurately by separating those elements which are related to investment (e.g., depreciation, return, maintenance, etc.) from those which are related to the line (e.g., billing, overheads, etc.).

- Other significant enhancements include a more robust switching module, the inclusion of business lines by CBG in the outside plant design architecture, the inclusion of a wireline/wireless economic crossover, and numerous user options, including a choice among copper/fiber break points.

The Public Notice requests that we comment on the Cost Proxy Model ("CPM") developed by Pacific Telesis and the Hatfield Model developed by Hatfield and Associates and submitted by AT&T Corp. ("AT&T") and MCI. U S WEST commented extensively on the Hatfield Model in our reply comments,[9] and we will not repeat those comments here.[10] We will provide minimal comment on the CPM since we are currently engaged in productive dialogue to determine if the best attributes of the BCM2 and the CPM can be combined to develop a superior model for the targeting of high-cost support. Presently, we are experimenting with combining the dynamic design elements of the BCM2 and the use of the "grid cell"

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[9] Reply Comments of U S WEST, CC Docket No. 96-45, filed May 7, 1996 ("96-45 Reply Comments").

[10] In our 96-45 Reply Comments we also commented on criticisms of the BCM which had been made by Economics and Technology, Inc. ("ETI") on behalf of National Cable Telecommunications Association ("NCTA"), and we, likewise, will not repeat those comments here.

methodology (for certain sparsely populated areas) of the CPM to obtain a better

approximation of customer location and network costs.

Ideally, when comparing different models which purport to represent the

same thing, it is helpful to have comparable data from each of the models.

Unfortunately, data from the Hatfield Model has been difficult to obtain. The first

problem is that the Hatfield Model is changing continually.[11] Getting the Hatfield

Model, to put it bluntly, has been like pulling teeth. Running it has been even more

difficult. When finally obtained, copies of the Hatfield Model have been incomplete

and cumbersome to operate, and the sources of data or intermediate model results

have been difficult to determine. Attempts to obtain useful information on the

Hatfield Model through the formal discovery process have proven to be frustrating

and fruitless.[12]

Fortunately, the Commission has recently issued data requests to the

sponsors of all three models which hold the promise of finally providing an apples-

to-apples comparison of the model results, methodology, and data sources. We will

reserve a complete commentary on these models until this useful information is

available and can be analyzed.

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[11] Indeed, in documentation of the Hatfield Model Version 2.2, Release 1, attached to AT&T's reply comments in CC Docket No. 96-45, it is stated "(f)or these reasons, it may be difficult (and potentially fruitless) to compare numerical results generated by this model with those generated by previous versions." Reply Comments of AT&T, CC Docket No. 96-45, filed May 30, 1996, Appendix D at 4.

[12] See U S WEST's Petition for Order Directing That Discovery Be Permitted, CC Docket No. 96-98, filed June 13, 1996.

Based upon knowledge of these models obtained to date and our experience in the evolution of these models, U S WEST offers the following criteria we feel should guide the evaluation of proxy models and comments on how the BCM2 and Hatfield Model fit these criteria:

II. THE PROXY COST MODEL SHOULD BE PUBLICLY AVAILABLE AND EASY TO UNDERSTAND AND OPERATE

From their inception, both the BCM and the BCM2 have been in the public domain. The models themselves have been placed on the record at the same time as the data which they produced was filed. Public workshops have been conducted to provide detailed instructions on how the models operate and how to run them. Individual assistance has been provided to model users when requested. Model inputs, intermediate results, and outputs are easily accessible on EXCEL worksheets. Filed results can be replicated by users. Users can change model inputs to test the sensitivity of results.

III. THE PROXY COST MODEL INPUTS AND OUTPUTS SHOULD BE REASONABLE

The Telecommunications Act of 1996 states that implicit support for universal service should be replaced with "specific, predictable and sufficient" explicit support.[13] It is therefore important that the results developed by a proxy

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[13] Telecommunications Act of 1996, Pub. L. No. 104-104, 110 Stat. 56, 73 § 254(d) (1996) ("1996 Act").

cost model bear some resemblance to the real-world cost of providing basic telephone service.

U S WEST believes that the Hatfield Model seriously underestimates the cost of constructing a network to provide basic telephone service. When AT&T was attempting to convince the Commission that the provision of unbundled network elements by incumbent local exchange carriers ("LEC") was necessary, they estimated the cost of constructing a loop at approximately $1,250.[14] Now, when it comes to the pricing of those unbundled elements, AT&T and Hatfield say that the cost for U S WEST's territory (which is among the least populated in the nation) is more like $400 per loop.[15] This difference of more than three times raises serious questions about the validity of the Hatfield Model estimates as well as AT&T's motives. A further confirmation that the Hatfield Model cost is far too low is that the BCM2 and the CPM, which determine the cost of service in different ways, both come to almost the same estimate for the average investment in California.[16]

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[14] See In the Matter of Implementation of the Local Competition Provisions in the Telecommunications Act of 1996, CC Docket No. 96-98, Notice of Proposed Rulemaking, FCC 96-182, rel. Apr. 19, 1996 ¶ 7 and n.15. AT&T estimated that it would cost "$29 billion to construct new facilities in local markets in order to be able to provide full facilities to reach 20 percent of the 117 million access lines served by the BOCs."

[15] See AT&T Communications of the Mountain States, Inc., Responses to the Third Set of Interrogatories and Requests for Production of Documents of U S WEST Communications, Inc., dated April 3, 1996, Utah Docket Nos. 94-222-01, 95-2206-01, 94-999-01, 95-049-T16 ("estimates loop costs to be approximately $357 per line.").

[16] The CPM estimates loop investment for the State of California to be $625. The BCM2 estimates loop investment for the State of California to be $706.

Input variables must also be subject to confirmation of reasonableness. The model sponsor should be able to demonstrate that material costs and supplier discounts are reasonably consistent with what telecommunications providers are experiencing in the prudent construction of networks today. U S WEST believes that the subscriber loop electronics prices used in the Hatfield Model are significantly below current costs and that the supplier discounts assumed in the Hatfield Model are significantly above what even the largest of the Regional Bell Operating Companies ("RBOC") can obtain from their best suppliers.

IV. THE NETWORK DESIGNED BY THE PROXY COST MODEL SHOULD BE CAPABLE OF PROVIDING HIGH QUALITY TELEPHONE SERVICE

Both the Hatfield Model and ETI in its critique of the BCM use distribution and feeder fill factors of as much as 95%. While such a hypothetical network would appear to be lower in cost than a real telephone network, it would not be capable of providing the quality of service that customers expect and regulators demand. Real telephone companies must be ready to provide service anywhere in their territory on several days' notice. If facilities are not available to provide the requested service, the telephone company must take a "held order" and begin new construction activity to provide service to the customer. This new construction would involve digging up streets and tearing up existing back yards and significant additional costs would be incurred. The communities we serve are dynamic entities. Population grows, new homes are built, areas are redeveloped, people move.

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The 1996 Act requires that "sufficient" funding be provided to support the continued provision of affordable universal service. Any model which will be the basis for the determination of necessary funding must contemplate a network capable of providing the level of service to which the regulatory body holds local network service providers accountable in the real world marketplace. The use of an unrealistic network design which results in an apparent lower cost but would produce service levels below the required standard would not meet the requirements of the 1996 Act.

V.   THE PROXY COST MODEL SHOULD ACCURATELY
      REFLECT THE ELEMENTS WHICH IT PURPORTS TO REFLECT

The Hatfield Model has claimed to use the output of the BCM in its development of loop costs. Indeed, the documentation filed in AT&T's comments of May 16, 1996 states that the model "uses certain outputs from the Benchmark Cost Model."[17] At other times, Hatfield has spoken of "extensions" or "modifications" to the BCM. While U S WEST has been unsuccessful in its efforts to discover exactly what changes have been made to the BCM outputs used in the Hatfield Model, we have conducted some fairly fundamental analysis of the Hatfield Model's outputs and the BCM outputs which cause us to question whether the current version of the Hatfield Model uses much, if any, output from the BCM.

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[17] Comments of AT&T, CC Docket No. 96-98, filed May 16, 1996, Appendix E at 1 (Documentation of the Hatfield Model, Version 2.2, Release 1).

Table 1 will help to illustrate this comparison. The first and second columns of numbers show the two outputs of the BCM utilizing the two expense-to-investment multipliers used by the BCM.[18] The first column shows the monthly cost of basic service utilizing the BCM/ARMIS factor. For Alabama this is $26.46 per month. The second column shows the cost using the BCM/MCI/Hatfield ("BCM/M/H") factor which for Alabama equates to $19.19 per month. The third column shows the monthly cost produced by the Hatfield study Version 2.2, Release 1, of $20.22. For Alabama, the BCM/M/H and the new Hatfield study results are quite close. Since the primary factor which causes some states to be higher than others in the BCM is average loop length and average loop costs, one would expect that there would be a strong positive correlation between the results of the BCM and the Hatfield studies. That is, when BCM shows a state's loop cost to be high, the Hatfield study would likewise show a high result for that state. This would be the expected outcome if, as AT&T states, the Hatfield Model uses the loop cost output of the BCM.

To test this hypothesis, the fourth column of numbers is the ratio of BCM/M/H to the new Hatfield study results. If there is a close correlation between the two studies, one would expect the numerical ratio of the two study results to be fairly consistent. What this table shows is that this ratio varies quite widely, in an

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[18] The BCM utilizes an "ARMIS" factor of 31.68%, which compares the most recent ratio of actual expenses to actual investment, and an "MCI/Hatfield" factor of 22.97%, which is based upon a special study done for MCI by Hatfield and Associates. The Joint Sponsors included both factors in the model report since they could not agree on which was more appropriate.

almost random pattern. For example, in the District of Columbia, BCM/M/H produces a cost of $8.11, while Hatfield yields $17.07. However in Montana, while BCM/M/H yields $39.58, Hatfield yields $20.41, slightly less than the State of Ohio ($20.44). Similar radical decreases in cost can be seen in Idaho, Wyoming, and the Dakotas, to name a few. Indeed, when looking at the results across all states, the one factor that seems to stand out is the relative homogeneity of the Hatfield Model results, particularly when contrasted to the variations identified by the BCM.

TABLE 1

STATE	BCM/ARMIS 1	BCM/M/H 2	HATFIELD 3	RATIO (2/3) 4
AL	$26.46	$19.19	$20.22	0.95
AR	$33.56	$24.34	$23.41	1.04
AZ	$21.26	$15.41	$15.94	0.97
CA	$18.05	$13.09	$13.49	0.97
CO	$25.80	$18.71	$17.84	1.05
CT	$18.80	$13.63	$17.27	0.79
DC	$11.19	$8.11	$17.07	0.48
DE	$21.93	$15.90	$16.48	0.96
FL	$20.40	$14.79	$17.11	0.86
GA	$27.49	$19.93	$17.77	1.12
IA	$31.58	$22.90	$16.33	1.40
ID	$40.94	$29.69	$17.80	1.67
IL	$20.73	$15.03	$17.38	0.86
IN	$20.58	$14.93	$16.63	0.90
KS	$33.01	$23.94	$21.71	1.10
KY	$25.45	$18.46	$20.64	0.89
LA	$26.45	$19.18	$18.74	1.02
MA	$13.12	$9.52	$15.25	0.62
MD	$18.56	$13.46	$17.80	0.76
ME	$34.24	$24.83	$19.32	1.29
MI	$22.95	$16.64	$18.96	0.88
MO	$28.43	$20.61	$20.51	1.00
MS	$32.04	$23.24	$26.49	0.88
MT	$54.58	$39.58	$20.41	1.94
NC	$27.32	$19.81	$18.95	1.05

STATE	BCM/ARMIS 1	BCM/M/H 2	HATFIELD 3	RATIO (2/3) 4
ND	$50.60	$36.69	$21.96	1.67
NE	$36.53	$26.49	$20.19	1.31
NH	$28.31	$20.53	$18.10	1.13
NJ	$16.86	$12.23	$16.03	0.76
NM	$34.67	$25.14	$18.51	1.36
NV	$29.17	$21.15	$21.32	0.99
NY	$16.58	$12.02	$16.58	0.72
OH	$21.40	$15.52	$20.44	0.76
OK	$26.59	$19.28	$21.17	0.91
OR	$27.99	$20.29	$16.63	1.22
PA	$20.24	$14.67	$15.08	0.97
RI	$17.67	$12.82	$15.23	0.84
SC	$28.55	$20.70	$18.77	1.10
SD	$51.02	$37.00	$21.88	1.69
TN	$27.27	$19.77	$20.09	0.98
TX	$25.14	$18.23	$16.96	1.07
UT	$28.01	$20.31	$16.45	1.23
VA	$19.85	$14.39	$18.43	0.78
VT	$36.02	$26.12	$21.88	1.19
WA	$23.48	$17.02	$14.94	1.14
WI	$27.18	$19.71	$16.68	1.18
WV	$31.44	$22.80	$23.42	0.97
WY	$48.14	$34.91	$23.16	1.51

So, does the Hatfield Model use the output from the BCM to determine loop costs? If it does, then AT&T and MCI should be required to come forward and show exactly what modifications were made to the BCM data, particularly since the deviations are so great. This burden of proof should be especially high since AT&T is arguing that this study should determine the prices for tens of billions of dollars of services which AT&T will purchase to compete with the LECs.

VI. THE PROXY COST MODEL AND ITS APPLICATION TO THE TARGETING OF HIGH-COST SUPPORT TO SPECIFIC GEOGRAPHIC AREAS SHOULD ASSURE THE CONTINUED PROVISION OF AFFORDABLE BASIC TELEPHONE SERVICE AND ENCOURAGE THE EFFICIENT EVOLUTION OF LOCAL COMPETITION

An area which has received considerable debate in the universal service proceeding is the level of geography to which explicit support should be targeted. U S WEST has consistently supported the targeting of support to the CBG. U S WEST has taken this position since it would result in no support being targeted to urban, suburban, or town areas where costs are low. In this way competition can develop naturally in these areas (where it would be expected to develop first) without the impediment of any unnecessary explicit support payments. Competition would likewise be more likely to develop in higher-cost rural areas since the support payment would be much closer to the cost of serving these customers. This would increase the chances that rural customers would have a choice of local service providers.

NCTA filed comments prepared by ETI which suggested that support payments should be targeted to the wire center based upon average cost across the entire wire center.[19] U S WEST believes that such targeting would have two serious downside consequences. First, if average costs for the entire wire center are high, and funding were warranted, providers which serve lower-cost customers near the

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[19] See Comments of NCTA, filed Apr. 12, 1996, CC Docket No. 96-45 at 10-11.

central office[20] will receive a "windfall" since they potentially could receive more in "subsidy" payments than it costs to serve the customer. Conversely, the incentive of other providers to serve higher-cost customers in more sparsely populated areas of the wire center would be reduced since the support payment, based upon average costs, would be substantially less than the actual cost of serving those customers. Indeed, every dollar of "windfall" support which a new entrant received for serving a lower-cost customer was really intended to support affordable rates for the higher-cost remote customers. If, at some time in the future, supplemental funding is necessary to support the provision of affordable service to these truly high-cost customers, the actual amount of funding (that which is necessary plus that which is a "windfall") could indeed be greater than if funding had been directed properly in the first place.

In an ex parte filed June 20, 1996, ETI proposes an alternative method for targeting high-cost support. It suggests that proxy costs be calculated at the CBG level but then aggregated up to an average wire center level. This wire center average would then be compared to the funding benchmark, and, if it exceeded the benchmark, a second test would be made. CBGs below the benchmark would receive no funding; however, CBGs where the cost exceeded the benchmark would receive the difference between cost and the benchmark as explicit support. While this would take care of the problem of providing a windfall to providers serving low-

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[20] No matter how high the average cost of serving in a wire center, customers located near the wire center will always be low in cost to serve.

cost customers, and in many circumstances would wind up functioning similarly to the CBG targeting approach, it would have one aspect which would cause discriminatory treatment among customers.

Assume two CBGs have an identical cost of $100/month and the funding benchmark is $30/month. The first CBG, CBG-A is located outside of a small town, where the average cost for the wire center is $35. Since this exceeds the benchmark cost of $30, customers in CBG-A would receive $70/month ($100 - $30 = $70) in support. CBG-B, however, is located outside of a slightly larger town where the average cost for the wire center is $29/month. Since this wire center average cost is less than the $30 benchmark, customers in CBG-B would receive no funding support, even though in all other respects they are equivalent to those in CBG-A. Under U S WEST's proposed CBG targeting plan, customers in both CBGs would receive $70/month.

Of even greater concern in the targeting of support for affordable service is the fact that the Hatfield Model does not compute cost at the CBG level.[21] Even though the Hatfield Model claims to start with BCM results, which do have costs at the CBG level, in the process of its aggregation it loses the CBG identity and produces only results averaged and summarized over six density zones. Following is summary of the reported results for Colorado.[22]

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[21] The Hatfield Model does not even include the identification number for CBGs carried forward from the BCM.

[22] Reply Comments of AT&T, CC Docket No. 96-98, filed May 30, 1996, Appendix D, Cost of Network Elements at 5.

DENSITY GROUP[23]	AVERAGE COST
0-5 hh/mi^2	$72.30
5-200 hh/mi^2	$24.22
200-650 hh/mi^2	$17.25
650-850 hh/mi^2	$16.04
850-2550 hh/mi^2	$15.64
over 2550 hh/mi^2	$14.46

Thus, the Hatfield Model loses the distance from the central office factor, which is often the most significant factor in determining high-cost CBGs. Using the Hatfield Model and a $30 benchmark, only households in the 0-5 hh/mi^2 density band would qualify for high-cost funding, and all households in this band would receive $42.30/month. ($72.30 - $30 = $42.30), regardless of the cost to serve individual customers.[24] The BCM2 results filed July 3, 1996[25] show the following distribution of Colorado customers with a cost to serve in excess of $70/month.

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[23] Expressed as households per square mile.

[24] For example, it is possible for a low-density area to be located fairly close to the wire center and the overall cost of serving this area to be relatively low.

[25] See July 3 Letter at 43.

COST RANGE	HOUSEHOLDS
$70<=$75/mo.	8,677
$75<=$100/mo.	31,363
$100<=$150/mo.	16,703
$150<=$200/mo.	5,187
$200<=$250/mo.	3,502
$250<=$300/mo.	213

Thus, use of the Hatfield Model to "target" high-cost support would result in more than 50,000 Colorado customers receiving inadequate funding to support the provision of affordable universal service. (It is unknown from this data how many new entrants might receive a "windfall" from receiving a support payment of $42.30 for serving customers with a substantially lower cost to serve.)

VII.   CONCLUSION

An evaluation of proxy cost models should include the following criteria:

- The model should be publicly available and easy to understand and operate;

- Model inputs and outputs should be reasonable;

- The network designed by the proxy cost model should be capable of providing high-quality telephone service;
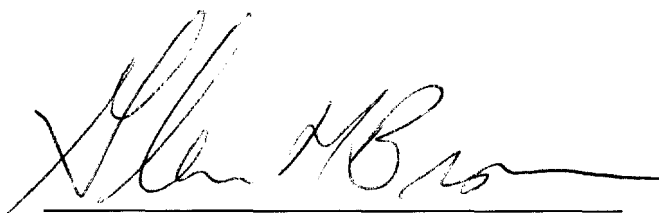
- The model should accurately reflect the elements it purports to reflect; and

- The model and its application to the targeting of high-cost support to specific geographic areas should assure the continued provision of affordable basic telephone service and encourage the efficient evolution of local competition.

Respectfully submitted,

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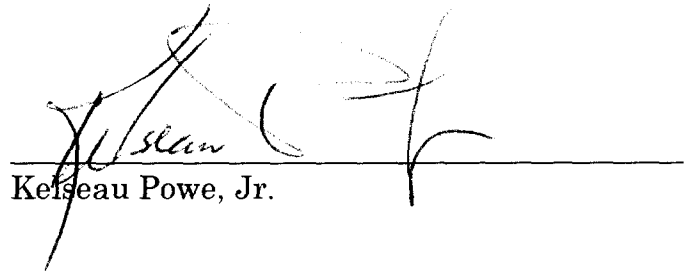Washington, DC 20036

Its Executive Director

Of Counsel,
Dan L. Poole

August 9, 1996

CERTIFICATE OF SERVICE

I, Kelseau Powe, Jr., do hereby certify that on this 9th day of August, 1996, I

have caused a copy of the foregoing **COMMENTS ON COST PROXY MODELS** to

be served via first-class United States Mail, postage prepaid, upon the persons

listed on the attached service list.

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*Via Hand-Delivery

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